

AMENDMENTS TO THE CLAIMS

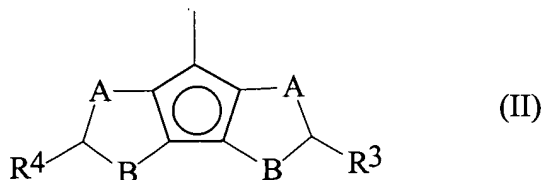
1. (previously presented) A metallocene compound of general formula (I):



wherein

L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(\text{CR}^1\text{R}^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_2\text{-C}_{20}$ -alkenyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl, or $\text{C}_7\text{-C}_{20}$ -arylalkyl radical, optionally containing a heteroatom, which can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z is a moiety of formula (II):

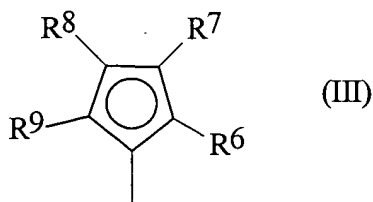


wherein

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_2\text{-C}_{20}$ -alkenyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl, or $\text{C}_7\text{-C}_{20}$ -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_2\text{-C}_{20}$ -alkenyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl, or $\text{C}_7\text{-C}_{20}$ -arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR^5 or if B is S or O, then A is CR^5 , and wherein either A or B is different than CR^5 and the rings containing A and B have a double bond in an allowed position;

G is a moiety of formula (III):



wherein

R^6 , R^7 , R^8 and R^9 , which may be the same as or different from each other, are selected from hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R^6 and R^7 , and R^8 and R^9 can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R^7 is different from R^8 and when R^7 is a tert-butyl radical, R^8 is not hydrogen;

M is an atom of a transition metal selected from those belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements,

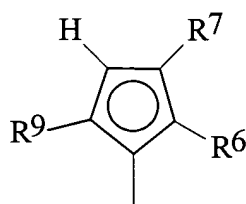
X, which may be the same or different, is a hydrogen atom, halogen atom, a group R^{10} , OR^{10} , OSO_2CF_3 , $OCOR^{10}$, SR^{10} , NR^{10}_2 or PR^{10}_2 , wherein the substituents R^{10} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms;

p is an integer of from 1 to 3, being equal to the oxidation state of the metal M minus 2; with the proviso that said metallocene compound is different from:

isopropylidene (3-trimethylsilylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-trimethylsilylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-ethylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-ethylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-n-butylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-n-butylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-methylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-methylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-i-propylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride and dimethylsilanediyl (3-i-propylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride.

2. (previously presented) The metallocene according to claim 1, wherein the transition metal M is selected from titanium, zirconium or hafnium.

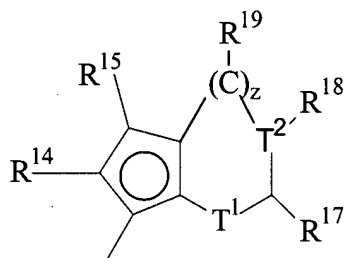
3. (previously presented) The metallocene according to claim 1, wherein L is CMe₂ or SiMe₂.
4. (previously presented) The metallocene according to claim 1, wherein A or B is a sulfur atom and the other is a CH group.
5. (previously amended) The metallocene according to claim 1, wherein R³ and R⁴ are the same and are a C₁-C₂₀-alkyl group, which can contain a silicon atom.
6. (previously amended) The metallocene according to claim 1, wherein G is a moiety of formula (IIIa):



(IIIa)

wherein

- R⁶ and R⁹ equal to or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements;
- R⁷ is a C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl or a QR¹¹R¹²R¹³ group, wherein Q is C, Si, or Ge; R¹¹, R¹² and R¹³, which may be the same as or different from each other, are hydrogen, C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radicals, optionally containing a heteroatom, with the proviso that when Q is a carbon atom, at least one of R¹¹, R¹² and R¹³ is a hydrogen atom.
7. (previously presented) The metallocene according to claim 6, wherein R⁷ is a phenyl, a CHR¹¹R¹² or a SiR¹¹R¹²R¹³ group, wherein R¹¹, R¹² and R¹³ are hydrogen or C₁-C₂₀-alkyl groups.
 8. (previously presented) The metallocene according to claim 1, wherein G is a moiety of formula (IV):



(IV)

wherein

T¹ is a sulfur atom or a CR¹⁶ group;

T² is a carbon atom or a nitrogen atom;

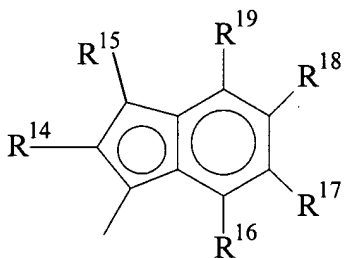
z is 1 or 0;

the ring containing T¹ and T² has double bonds in the allowed position;

with the proviso that if z is 1, T¹ is a CR¹⁶ group and T² is a carbon atom and the ring formed is a benzene ring; and if z is 0, T² bonds directly the cyclopentadienyl ring, the 5 membered ring formed has double bond in any of the allowed positions having an aromatic character and T¹ and T² are not at the same time, a sulfur atom and a nitrogen atom.

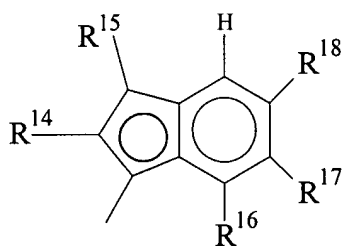
R¹⁴, R¹⁵, R¹⁶, R¹⁷, R¹⁸ and R¹⁹, same or different, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, any of two adjacent R¹⁴, R¹⁵, R¹⁶, R¹⁷, R¹⁸ and R¹⁹ can form a ring comprising 4 to 8 atoms optionally bearing substituents.

9. (previously presented) The metallocene according to claim 8, wherein G is a moiety of formula (IVa):



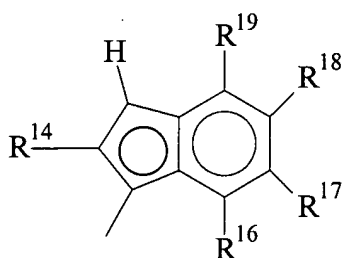
(IVa)

- wherein R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms, and any of two adjacent R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} can form a ring comprising 4 to 8 atoms optionally bearing substituents and the benzene ring optionally being perhydrated.
10. (previously presented) The metallocene according to claim 9, wherein G is a moiety of formula (IVb)



(IVb)

- wherein R^{15} , R^{16} , R^{17} , and R^{18} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and any of two adjacent R^{15} , R^{16} , R^{17} , R^{18} can form a ring comprising 4 to 8 atoms optionally bearing substituents; R^{14} being a C_1 - C_{20} -alkyl or C_6 - C_{20} -aryl group.
11. (previously presented) The metallocene according to claim 9, wherein G is a moiety of formula (IVc)



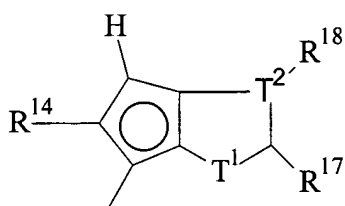
(IVc)

wherein R^{14} , R^{16} , R^{17} , and R^{18} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and optionally any of two adjacent R^{16} , R^{17} , and R^{18} can form a ring comprising 4 to 8

atoms optionally bearing substituents;

R¹⁹ is a C₁-C₂₀-alkyl or C₆-C₂₀-aryl group or forms with R¹⁸ a benzene ring optionally bearing substituents.

12. (previously presented) The metallocene according to claim 11, wherein R¹⁴ is a C₁-C₂₀-alkyl or C₆-C₂₀-aryl group.
13. (previously presented) The metallocene according to claim 11, wherein R¹⁶ is a C₁-C₂₀-alkyl or C₆-C₂₀-aryl.
14. (previously presented) The metallocene according to claim 8, wherein G is a moiety of formula (IVd):



(IVd)

wherein

T¹ is a sulfur atom or a CR¹⁶ group;

T² is a carbon atom or a nitrogen atom;

the 5 member ring formed by T¹ and T² has double bonds in any of the allowed positions, having an aromatic character;

with the proviso that if T¹ is a sulphur atom T² is not a nitrogen atom;

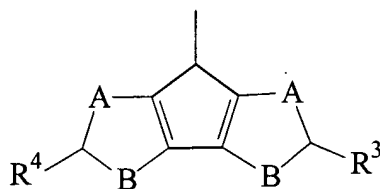
R¹⁴, R¹⁷ and R¹⁸ which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements and R¹⁷ and R¹⁸ can form a ring comprising 4 to 8 atoms optionally bearing substituents.

15. (previously presented) The metallocene according to claim 14 wherein T² is a carbon atom; T¹ is a sulphur atom and R¹⁴, R¹⁷ and R¹⁸ equal to or different from each other are a C₁-C₂₀-alkyl, or C₆-C₂₀-aryl.
16. (previously presented) A ligand of formula (V):



wherein L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(\text{CR}^1\text{R}^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z' is a moiety of formula (VI):



(VI)

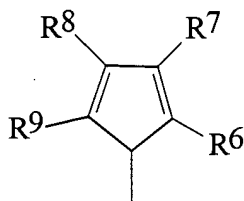
or its double bond isomers;

wherein the double bonds are in an allowed position;

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR^5 or if B is S or O, then A is CR^5 , and wherein either A or B is different than CR^5 and the rings containing A and B have a double bond in the allowed position;

G' is a moiety of formula (VII):



(VII)

or its double bond isomers;

wherein

R^6 , R^7 , R^8 and R^9 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R^6 and R^7 , and R^8 and R^9 can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R^7 is different from R^8 and when R^7 is a tert-butyl radical, R^8 is not hydrogen.

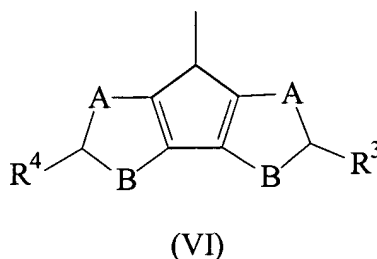
17. (previously presented) A process for the preparation of a ligand of formula (V):



wherein

L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(CR^1R^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z' is a moiety of formula (VI):



or its double bond isomers;

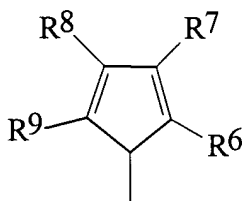
wherein the double bonds are in an allowed position;

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a C_1 - C_{20} -alkyl,

C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR⁵ or if B is S or O, then A is CR⁵, and wherein either A or B is different than CR⁵ and the rings containing A and B have a double bond in the allowed position;

G' is a moiety of formula (VII):



(VII)

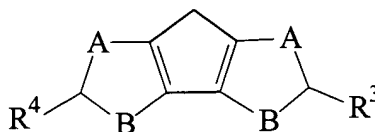
or its double bond isomers;

wherein

R⁶, R⁷, R⁸ and R⁹, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R⁶ and R⁷, and R⁸ and R⁹ can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R⁷ is different from R⁸ and when R⁷ is a tert-butyl radical, R⁸ is not hydrogen;

comprising the following steps:

- a) contacting a compound of the formula (VIII) with a base selected from the group consisting of metallic sodium and potassium, sodium and potassium hydroxide and an organic lithium compound, wherein the molar ratio between the compound of the formula (VIII) and said base is at least 1:1;



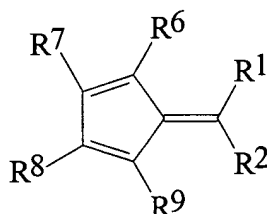
(VIII)

wherein

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR^5 or if B is S or O, then A is CR^5 , and wherein either A or B is different than CR^5 the rings containing A and B have a double bond in the allowed position;

- b) contacting the obtained anionic compounds of the formula from step a) with a compound of formula (IX):



(IX)

wherein

R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

R^6 , R^7 , R^8 and R^9 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R^6 and R^7 , and R^8 and R^9 can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R^7 is different from R^8 and when R^7 is a tert-butyl radical, R^8 is not hydrogen; and then

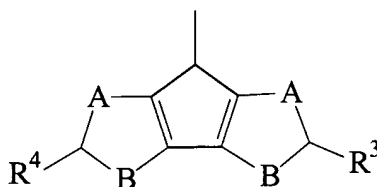
(c) treating the obtained product from step b) with a protonating agent.

18. (previously presented) A process for the preparation of a ligand of formula (V):



wherein L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(\text{CR}^1\text{R}^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z' is a moiety of formula (VI):



(VI)

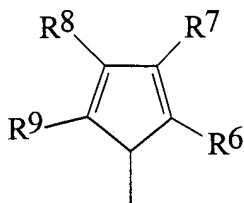
or its double bond isomers;

wherein the double bonds are in an allowed position;

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR^5 or if B is S or O, then A is CR^5 , and wherein either A or B is different than CR^5 and the rings containing A and B have a double bond in the allowed position;

G' is a moiety of formula (VII):



(VII)

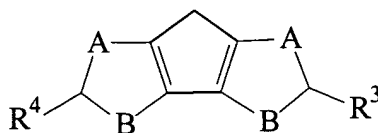
or its double bond isomers;

wherein

R^6 , R^7 , R^8 and R^9 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R^6 and R^7 , and R^8 and R^9 can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R^7 is different from R^8 and when R^7 is a tert-butyl radical, R^8 is not hydrogen;

comprising the following steps:

- a) contacting a compound of the formula (VIII) with a base selected from the group consisting of metallic sodium and potassium, sodium and potassium hydroxide and an organic lithium compound, wherein the molar ratio between the compound of the formula (VIII) and said base is at least 1:1



(VIII)

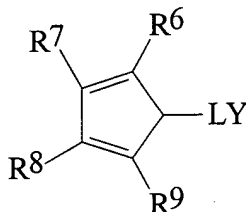
wherein

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR^5 or if B

is S or O, then A is CR⁵, and wherein either A or B is different than CR⁵ and the rings containing A and B have a double bond in the allowed position;

- b) contacting the obtained anionic compounds from step a) with a compound of formula (IX):



(IX)

wherein Y is a halogen radical selected from the group consisting of chloride, bromide and iodide;

L is a divalent group bridging the moieties G and Z, selected from CR¹R², SiR¹R² or (CR¹R²)₂, wherein R¹ and R², which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

R⁶, R⁷, R⁸ and R⁹, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R⁶ and R⁷, and R⁸ and R⁹ can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R⁷ is different from R⁸ and when R⁷ is a tert-butyl radical, R⁸ is not hydrogen.

19. (previously presented) A process for the preparation of a metallocene compound of general formula (I):

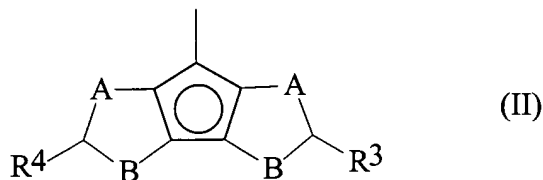


wherein

L is a divalent group bridging the moieties G and Z, selected from CR¹R², SiR¹R² or

(CR¹R²)₂, wherein R¹ and R², which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z is a moiety of formula (II):

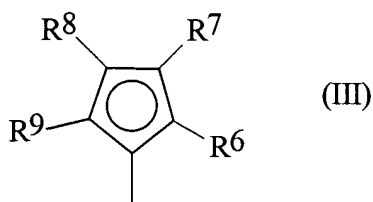


wherein

R³ and R⁴, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR⁵, wherein R⁵ is hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR⁵ or if B is S or O, then A is CR⁵, and wherein either A or B is different than CR⁵ and the rings containing A and B have a double bond in an allowed position;

G is a moiety of formula (III):



wherein

R⁶, R⁷, R⁸ and R⁹, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R⁶ and R⁷, and R⁸

and R^9 can form a ring comprising from 3 to 8 atoms, optionally bearing substituents, with the proviso that R^7 is different from R^8 and when R^7 is a tert-butyl radical, R^8 is not hydrogen;

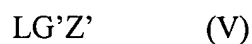
M is an atom of a transition metal selected from those belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements,

X, which may be the same or different, is a hydrogen atom, halogen atom, a group R^{10} , OR^{10} , OSO_2CF_3 , $OCOR^{10}$, SR^{10} , NR^{10}_2 or PR^{10}_2 , wherein the substituents R^{10} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms;

p is an integer of from 1 to 3, being equal to the oxidation state of the metal M minus 2; with the proviso that said metallocene compound is different from:

isopropylidene (3-trimethylsilylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, dimethylsilanediyl (3-trimethylsilylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, isopropylidene (3-ethylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, dimethylsilanediyl (3-ethylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, isopropylidene (3-n-butylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, dimethylsilanediyl (3-n-butylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, isopropylidene (3-methylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, dimethylsilanediyl (3-methylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride, isopropylidene (3-i-propylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride and dimethylsilanediyl (3-i-propylcyclopentadienyl)(7-cyclopentaditiophene)zirconium dichloride;

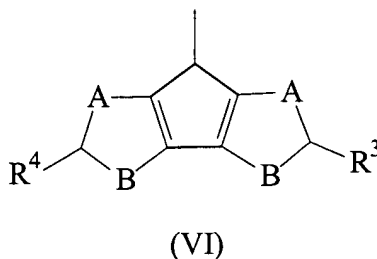
said process comprising contacting the ligand of general formula (V)



wherein L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(CR^1R^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8

atoms optionally bearing a substituent;

Z' is a moiety of formula (VI):



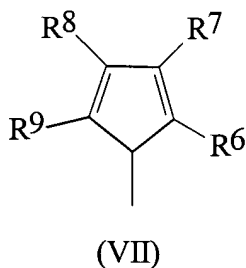
or its double bond isomers;

wherein the double bonds are in any of the allowed positions;

R³ and R⁴, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR⁵, wherein R⁵ is hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR⁵ or if B is S or O, then A is CR⁵, and wherein either A or B is different than CR⁵ and the rings containing A and B have a double bond in the allowed position;

G' is a moiety of formula (VII):



or its double bond isomers;

wherein R⁶, R⁷, R⁸ and R⁹, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and at least one of substituent pairs R⁶ and R⁷, and R⁸ and R⁹ being

capable of forming a ring comprising from 3 to 8 atoms, optionally having substituents, with the proviso that R^7 is different from R^8 and when R^7 is a tert-butyl radical, R^8 is not hydrogen; with a base capable of forming a corresponding dianionic compound and thereafter with a compound of general formula MX_{p+2} , wherein

M is an atom of a transition metal selected from those belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements,

X, which may be the same or different, is a hydrogen atom, halogen atom, a group R^{10} , OR^{10} , OSO_2CF_3 , $OCOR^{10}$, SR^{10} , NR^{10}_2 or PR^{10}_2 , wherein the substituents R^{10} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms; and

p is an integer of from 1 to 3, being equal to the oxidation state of the metal M minus 2.

20. (previously presented) A catalyst obtained by contacting:

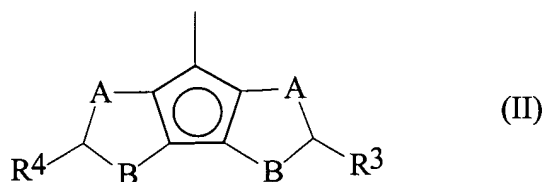
(A) a metallocene compound of formula (I)



wherein

L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(CR^1R^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z is a moiety of formula (II):



wherein

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a C_1 - C_{20} -alkyl,

C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR⁵ or if B is S or O, then A is CR⁵, and wherein either A or B is different than CR⁵ and the rings containing A and B have a double bond in an allowed position;

M is an atom of a transition metal selected from those belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements,

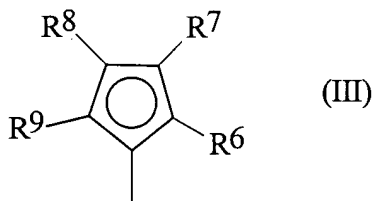
X, which may be the same or different, is a hydrogen atom, halogen atom, a group R¹⁰, OR¹⁰, OSO₂CF₃, OCOR¹⁰, SR¹⁰, NR¹⁰₂ or PR¹⁰₂, wherein the substituents R¹⁰ are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms;

p is an integer of from 1 to 3, being equal to the oxidation state of the metal M minus 2;

with the proviso that said metallocene compound is different from:

isopropylidene (3-trimethylsilylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-trimethylsilylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-ethylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-ethylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-n-butylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-n-butylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-methylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-methylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-i-propylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride and dimethylsilanediyl (3-i-propylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride;

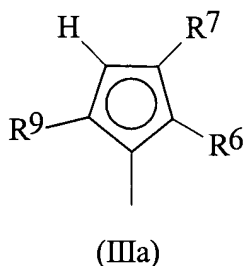
and G is a moiety of formula (III):



wherein R^6 , R^7 , R^8 and R^9 , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, at least one of substituent pairs R^6 and R^7 , and R^8 and R^9 can form a ring comprising from 3 to 8 atoms, optionally bearing substituents; with the proviso that R^7 is different from R^8 and when R^7 is a tertbutyl radical R^8 is not hydrogen; and

(B) at least one of an alumoxane and a compound capable of forming an alkyl metallocene.

21. (previously presented) The catalyst according to claim 20 wherein in the metallocene compound of formula (I) G is a moiety of formula (IIIa)



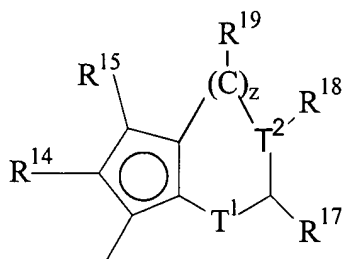
wherein

R^6 and R^9 equal to or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements

R^7 is a C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl or a $QR^{11}R^{12}R^{13}$ group, wherein Q is C, Si, or Ge;

R^{11} , R^{12} and R^{13} , which may be the same as or different from each other, are hydrogen, C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radicals, optionally containing a heteroatom, with the proviso that when Q is a carbon atom, at least one of R^{11} , R^{12} and R^{13} is a hydrogen atom,

or formula (IV)



(IV)

wherein

T^1 is a sulfur atom or a CR^{16} group;

T^2 is a carbon atom or a nitrogen atom;

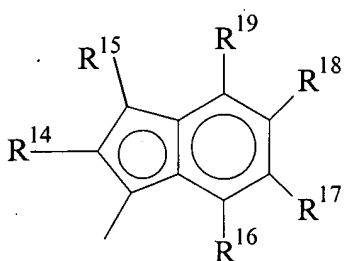
z is 1 or 0;

the ring containing T^1 and T^2 has double bonds in the allowed position;

with the proviso that if z is 1, T^1 is a CR^{16} group and T^2 is a carbon atom and the ring formed is a benzene ring; and if z is 0, T^2 bonds directly the cyclopentadienyl ring, the 5 membered ring formed has double bond in any of the allowed positions having an aromatic character and T^1 and T^2 are not at the same time, a sulfur atom and a nitrogen atom.

R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} , same or different, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, any of two adjacent R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} can form a ring comprising 4 to 8 atoms optionally bearing substituents.

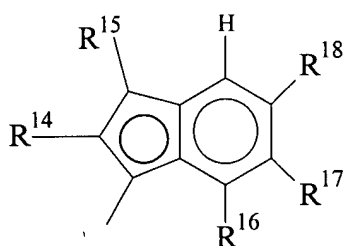
22. (previously presented) The catalyst according to claim 21 wherein in the metallocene compound of formula (I) G is a moiety selected from the compound of formula (IVa),



(IVa)

wherein R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} , which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms, and any of two adjacent R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} can form a ring comprising 4 to 8 atoms optionally bearing substituents and the benzene ring optionally being perhydrated,

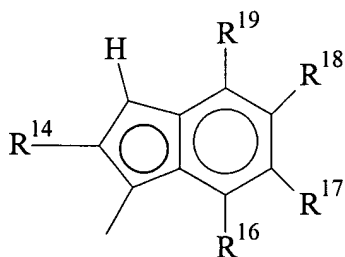
formula (IVb),



(IVb)

wherein R^{15} , R^{16} , R^{17} , and R^{18} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and any of two adjacent R^{14} , R^{15} , R^{16} , R^{17} , R^{18} can form a ring comprising 4 to 8 atoms optionally bearing substituents; R^{14} being a C_1 - C_{20} -alkyl or C_6 - C_{20} -aryl group,

formula (IVc),



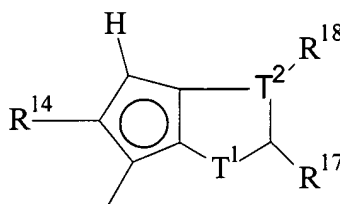
(IVc)

wherein R^{14} , R^{16} , R^{17} , and R^{18} are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, and optionally any of two adjacent R^{14} , R^{16} , R^{17} , R^{18} and R^{19} can form a ring comprising 4 to 8 atoms optionally bearing

substituents;

R^{19} is a C_1 - C_{20} -alkyl or C_6 - C_{20} -aryl group or forms with R^{18} a benzene ring optionally having substituents.

or formula (IVd)



(IVd)

wherein

T¹ is a sulfur atom or a CR¹⁶ group;

T² is a carbon atom or a nitrogen atom;

the 5 member ring formed by T¹ and T² has double bonds in any of the allowed positions, having an aromatic character;

with the proviso that if T¹ is a sulphur atom T² is not a nitrogen atom;

R^{14} , R^{17} and R^{18} which may be the same as or different from each other, are hydrogen, a C_1 - C_{20} -alkyl, C_3 - C_{20} -cycloalkyl, C_2 - C_{20} -alkenyl, C_6 - C_{20} -aryl, C_7 - C_{20} -alkylaryl, or C_7 - C_{20} -arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements and R^{17} and R^{18} can form a ring comprising 4 to 8 atoms optionally bearing substituents.

23. (Previously presented) The catalyst according to claim 20, wherein said alumoxane is selected from methylalumoxane (MAO), isobutylalumoxane (TIBAO) or 2,4,4-trimethylpentylalumoxane (TIOAO).
24. (Previously presented) The catalyst according to claim 20, wherein the compound capable of forming a metallocene alkyl cation is a compound of formula D^+E^- , wherein D^+ is a Brønsted acid, able to donate a proton and to react irreversibly with a substituent X of the metallocene of formula (I) and E^- is a compatible anion, which is able to stabilize the

active catalytic species originating from the reaction of the two compounds, and which is sufficiently labile to be able to be removed by an olefinic monomer.

25. (previously presented) A process for the preparation of a polymer of alpha-olefins comprising contacting one or more alpha-olefins under polymerization conditions with a catalyst obtained by contacting:

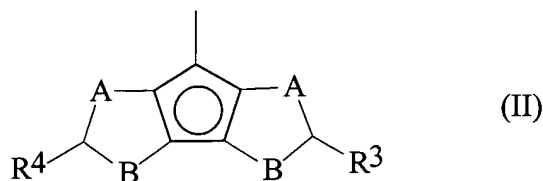
(A) a metallocene compound of formula (I)



wherein

L is a divalent group bridging the moieties G and Z, selected from CR^1R^2 , SiR^1R^2 or $(\text{CR}^1\text{R}^2)_2$, wherein R^1 and R^2 , which may be the same as or different from each other, are hydrogen, a $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_2\text{-C}_{20}$ -alkenyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl, or $\text{C}_7\text{-C}_{20}$ -arylalkyl radical, optionally containing a heteroatom, and can form a ring having 3 to 8 atoms optionally bearing a substituent;

Z is a moiety of formula (II):



wherein

R^3 and R^4 , which may be the same as or different from each other, are hydrogen, a $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_2\text{-C}_{20}$ -alkenyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl, or $\text{C}_7\text{-C}_{20}$ -arylalkyl radical, optionally containing a heteroatom;

A and B are sulfur (S), oxygen (O) or CR^5 , wherein R^5 is hydrogen, a $\text{C}_1\text{-C}_{20}$ -alkyl, $\text{C}_3\text{-C}_{20}$ -cycloalkyl, $\text{C}_2\text{-C}_{20}$ -alkenyl, $\text{C}_6\text{-C}_{20}$ -aryl, $\text{C}_7\text{-C}_{20}$ -alkylaryl, or $\text{C}_7\text{-C}_{20}$ -arylalkyl radical, optionally containing a heteroatom with the proviso that if A is S or O, then B is CR^5 or if B is S or O, then A is CR^5 , and wherein either A or B is different than CR^5 and the rings containing A and B have a double bond in an allowed position;

M is an atom of a transition metal selected from those belonging to group 3, 4, 5, 6 or to the lanthanide or actinide groups in the Periodic Table of the Elements,

X, which may be the same or different, is a hydrogen atom, halogen atom, a group R^{10} ,

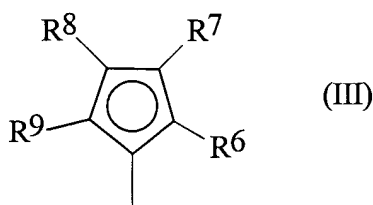
OR¹⁰, OSO₂CF₃, OCOR¹⁰, SR¹⁰, NR¹⁰₂ or PR¹⁰₂, wherein the substituents R¹⁰ are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms;

p is an integer of from 1 to 3, being equal to the oxidation state of the metal M minus 2;

with the proviso that said metallocene compound is different from:

isopropylidene (3-trimethylsilylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-trimethylsilylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-ethylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-ethylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-n-butylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-n-butylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-methylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, dimethylsilanediyl (3-methylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride, isopropylidene (3-i-propylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride and dimethylsilanediyl (3-i-propylcyclopentadienyl)(7-cyclopentadiene)zirconium dichloride;

and G is a moiety of formula (III):



wherein R⁶, R⁷, R⁸ and R⁹, which may be the same as or different from each other, are hydrogen, a C₁-C₂₀-alkyl, C₃-C₂₀-cycloalkyl, C₂-C₂₀-alkenyl, C₆-C₂₀-aryl, C₇-C₂₀-alkylaryl, or C₇-C₂₀-arylalkyl radical, optionally containing heteroatoms belonging to groups 13-17 of the Periodic Table of the Elements, at least one of substituent pairs R⁶ and R⁷, and R⁸ and R⁹ can form a ring comprising from 3 to 8 atoms, optionally bearing substituents; with the proviso that R⁷ is different from R⁸ and when R⁷ is a tertbutyl radical R⁸ is not hydrogen; and

(B) at least one of an alumoxane and a compound capable of forming an alkyl metallocene.

26. (original) The process according to claim 25 for the preparation of homo- and copolymers of propylene.
27. (previously presented) The process according to claim 26 wherein the process is carried out in the presence of an alpha-olefin selected from 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, 1-octene, 1-decene or 1-dodecene.
28. (original) The process according to claim 25 for the preparation of homo- and copolymers of ethylene.
29. (previously presented) The process according to claim 28, wherein the process is carried out in the presence of an olefin selected from propylene, 1-butene, 1-pentene, 4-methyl-1-pentene, 1-hexene, 1-octene, 4,6-dimethyl-1-heptene, 1-decene, 1-dodecene, 1-tetradecene, 1-hexadecene, 1-octadecene, 1-eicosene, allylcyclohexane, cyclopentene, cyclohexene and norbornene, 1,5-hexadiene, 1,6-heptadiene, 2-methyl-1,5-hexadiene, trans 1,4-hexadiene, cis 1,4-hexadiene, 6-methyl-1,5-heptadiene, 3,7-dimethyl-1,6-octadiene, 11-methyl-1,10-dodecadiene, or 5-ethylidene-2-norbornene .
30. (previously presented) The process according to claim 25 wherein the catalyst is supported on an inert carrier.
31. (previously presented) The process according to claim 25 characterized in that it is carried out in gas phase.
32. (currently amended) A propylene homopolymer having the following characteristics:
- triads (mm) satisfy the relation $55 < mm < 85$;
 - melting enthalpy (ΔH) of between 5 J/g and 70 J/g.
 - Haze (ASTM 2457) from 15% to 30%;
 - Gloss (60°C) (ASTM 2457) from 60% to 95%;
 - Tensile modulus (ASTM D4065) from 1000 MPa to 200 MPa;
 - Elongation at break (ASTM D4065) from 300% to 900%;
 - Strength at break (ASTM D638) from 10% to 40%
- wherein the propylene homopolymer is produced using the catalyst of claim 20.
33. (currently amended) A propylene copolymer containing from 0.1 to 30% by moles of units deriving from an olefin of formula $\text{CH}_2=\text{CHR}'$, R' being hydrogen, a $\text{C}_2\text{-C}_{20}$ -alkyl or a $\text{C}_6\text{-C}_{12}$ -aryl group, said propylene copolymer having the following characteristics:

- melting enthalpy < 70 J/g;
- triads (mm) satisfy the relation: $30 < \text{mm} < 85$

wherein the propylene copolymer is produced using the catalyst of claim 20.

34. (original) The propylene copolymer according to claim 33 wherein the olefin of formula $\text{CH}_2=\text{CHR}'$ is ethylene.
35. (previously presented) The metallocene compound according to claim 1 wherein at least one of R^3 and R^4 is different than hydrogen.
36. (previously presented) The propylene copolymer of claim 33 containing from 0.1 to 20% by moles of units deriving from the olefin of formula $\text{CH}_2=\text{CHR}'$.
37. (previously presented) The propylene copolymer of claim 33 wherein the melting enthalpy is lower than 50 J/g.
38. (previously presented) The propylene copolymer of claim 33 wherein the triads (mm) satisfy the relation $55 < \text{mm} < 85$.